特种计算机

Industrial Computer

产品说明书

User Manual

EC3-1816CLD2NA(B)

Cedar Trail + NM10 3.5 寸主板

Cedar Trail+NM10 3.5-inch Motherboard

Version:C01

法律资讯

警告提示

为了您的人身安全以及避免财产损失，必须注意本手册中的提示。人身安全的提示用一个警告三角表示，仅与财产损失有关的提示不带警告三角。警告提示根据危险等级由高到低如下表示。

⚠危险
表示如果不采取相应的小心措施，将会导致死亡或者严重的人身伤害。

⚠警告
表示如果不采取相应的小心措施，可能导致死亡或者严重的人身伤害。

⚠小心
带有警告三角，表示如果不采取相应的小心措施，可能导致轻微的人身伤害。

注意
表示如果不注意相应的提示，可能会出现不希望的结果或状态。

合格的专业人员

本文件所属的产品/系统只允许由符合各项工作要求的合格人员进行操作。其操作必须遵照各自附带的文件说明，特别是其中的安全及警告提示。 由于具备相关培训及经验，合格人员可以察觉本产品/系统的风险，并避免可能的危险。

EVOC产品

请注意下列说明：

⚠警告
EVOC产品只允许用于目录和相关技术文件中规定的使用情况。如果要使用其他公司的产品和组件，必须得到EVOC推荐和允许。正确的运输、储存、组装、装配、安装、调试、操作和维护是产品安全、正常运行的前提。必须保证允许的环境条件。必须注意相关文件中的提示。

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保修条款：

产品保修期一年。用户如另有要求，以双方签署的合同为准。

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文档说明

本文档适用范围

本文档适用于EVOC EC3-1816CLD2NA(B)型号。

约定

在本文档中，术语“本板”或“产品”有时特指EVOC EC3-1816CLD2NA(B)产品。

说明

安全相关注意事项

为避免财产损失以及出于个人安全方面的原因，请注意本入门指南中关于安全方面的信息。 文中使用警告三角来指示这些安全信息，警告三角的出现取决于潜在危险的程度。

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1.产品介绍

1.1 简介

本板采用Intel® Atom™D2550/N2600 + NM10芯片组（EC3-1816CLD2NA(B)-DW采用Intel® Atom™ D2550 + NM10芯片组，EC3-1816CLD2NA(B)-N2600采用Intel® Atom™ N2600 + NM10芯片组）；其中D2550为1M Cache 1.86GHz，N2600为1M Cache 1.6GHz；支持板载2GB DDR3 内存（EC3-1816CLD2NA(B)-DW的主板板载1066MHz的2GB内存， EC3-1816CLD2NA(B)-N2600的主板板载800MHz的2GB内存）；显示支持VGA、LVDS，支持单显或双显。板载2个10/100/1000Mbps网络接口。

本板具有丰富的外围接口，支持1个SATA接口，1个MSATA接口（可选）和1个CF卡（可选），MSATA和CF不可同时使用，选择方式可在BIOS SETUP里面设置；6个USB 2.0接口、4个串口（其中COM1支持RS-232/RS-485）；1个标准的MIC-IN/LINE-IN/LINE-OUT音频接口。

1.2 机械尺寸、重量与环境

- 外形尺寸（带散热器）：

  EC3-1816CLD2NA(B)-DW：146.1mm（长）×101.6mm（宽）×28mm（高）

  EC3-1816CLD2NA(B)-N2600：146.1mm（长）×101.6mm（宽）×33mm（高）

- 净重：0.19Kg；
- 工作环境：

  EC3-1816CLD2NA(B)-DW 支持：

  工作温度：0℃～60℃，可扩展温度：-40℃～80℃

  湿度：5 %～95%（非凝结状态）

  EC3-1816CLD2NA(B)-N2600 支持：

  工作温度：0℃～60℃，可扩展温度：-40℃～85℃

  湿度：5%～95%（非凝结状态）

- 贮存环境：

  温度：-40℃～80℃

  湿度：5%～95%（非凝结状态）

1.3 典型功耗

典型功耗是基于以下配置闲置状态的数值。

EC3-1816CLD2NA(B)-DW

CPU：板载 Intel® Atom ™ CPU D2550 @ 1.86GHz

内存：板载 Samsung/DDRIII 1066/2G

- +12V@0.9A；+5%/-3%；

EC3-1816CLD2NA(B)-N2600

CPU：板载 Intel® Atom ™ CPU N2600 @ 1.60GHz

内存：板载 Samsung/DDRIII 1066/2G

- +12V@0.68A；+5%/-3%；

1.4 微处理器

板载Intel® Atom™ D2550（双核）1M Cache 1.86GHz/N2600（双核）1M Cache 1.6GHz处理器。封装为Micro-FCBGA11。

1.5 芯片组

Intel® ATOM™ D2550/N2600 + NM10

1.6 系统内存

板载 2GB DDR3 内存，EC3-1816CLD2NA(B)-DW 内存支持 1066MHz，EC3-1816CLD2NA(B)-N2600 内存支持 800MHz。

1.7 显示功能

- 支持VGA、LVDS显示， VGA支持热插拔功能；都为同步输出；
- VGA支持最高分辨率及刷新率为1920×1200@60Hz，LVDS最大支持1920×1080@60HZ。

1.8 网络功能

提供2个10/100/1000Mbps网络接口，LAN1可支持网络唤醒功能。

1.9 音频功能

采用HDA标准，支持 MIC-IN/LINE-IN/LINE-OUT。

1.10 电源特性

采用单12V供电。

注：默认模拟ATX电源开关机，如需采用AT开机模式，请参看说明书2.4.2部分，做相应的跳线设置。

1.11 Watchdog功能

- 支持 255 级，可编程按分或秒；
- 支持看门狗超时中断或复位系统。

1.12 操作系统

支持操作系统：WINCE/WINXP/WINXPE/WIN7/Linux

1.13 I/O接口

- 提供 4 个串口，其中 COM1 支持 RS-232/RS-485 模式选择；
- 支持 1 个 SATA 接口，1 个 MSATA 接口（可选）或者 1 个 CF 卡接口（可选）。（通过 BIOS 中的“Advanced”-“SATA”—“SATA port Mode as”，在这里选择 MSATA 或者 CF 卡）；
- 提供 6 个 USB2.0 接口；
- 提供 1 个 PS/2 键盘/鼠标接口；
- 提供 1 个 8 路数字 I/O 接口。

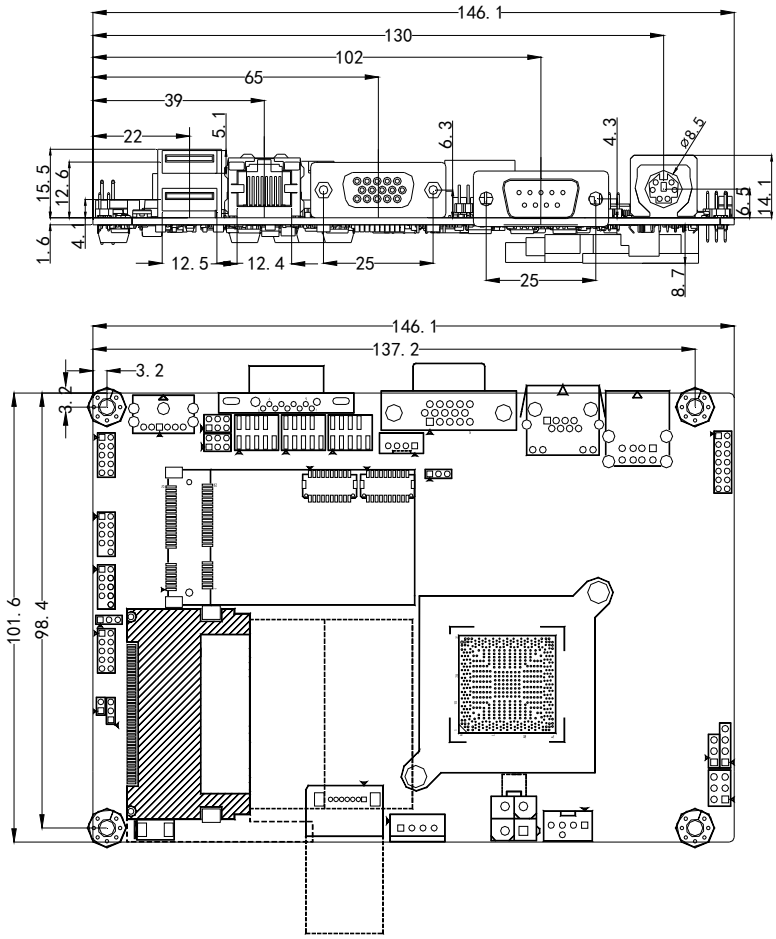
提示：如何识别跳线、接口第一脚

1、观察插头、插座旁边的文字标记，通常用“1”或加粗的线条或三角符号表示。

2、看看背面的焊盘，通常方型焊盘为第一脚。

2.安装说明

2.1 产品外形尺寸图

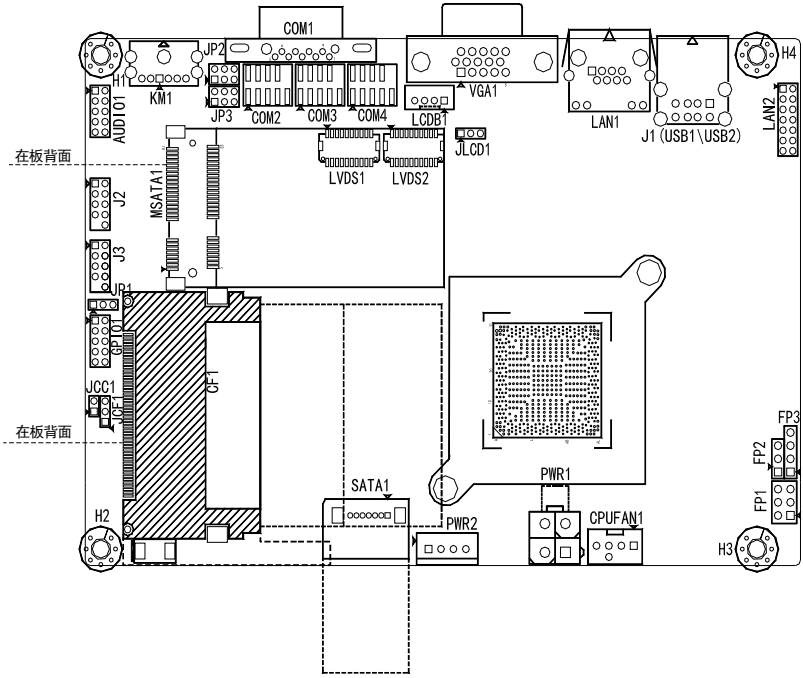


单位：mm

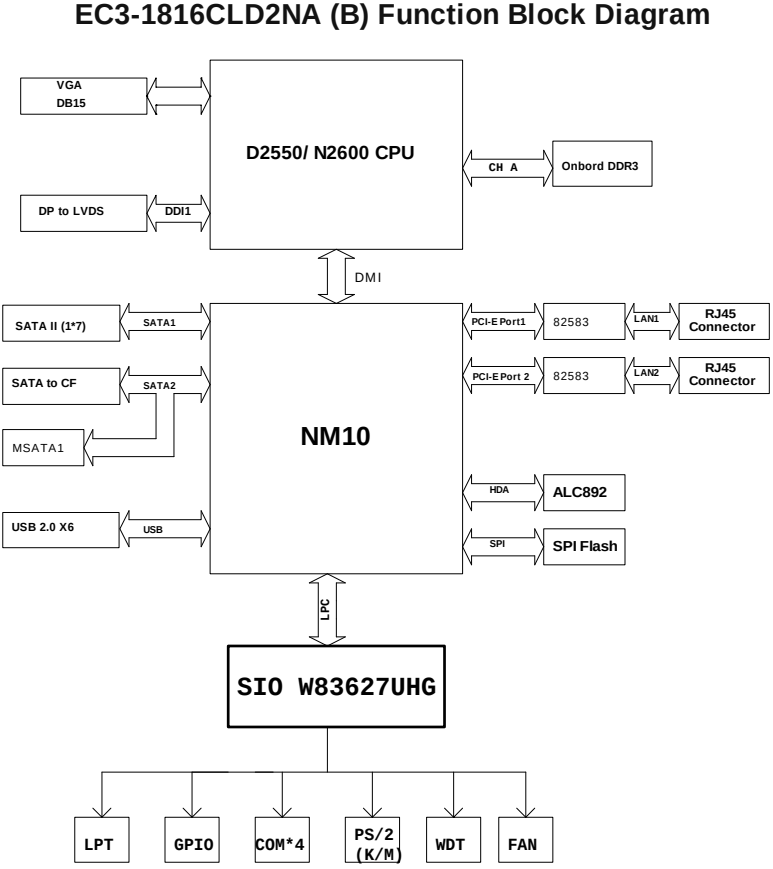
警告！

请务必选择合适的螺钉和使用正确的安装方法（包括板卡定位、CPU、散热器等安装），否则可能损坏板。此板推荐 H1～H4 使用 M3×6 GB9074.4-88 螺钉。

2.2 接口位置示意图


COM1
JP2
H1
KM1
AUDIO1
JP3
COM2
COM3
COM4
LCDB1
VGA1
LAN1
J1 (USB1\USB2)
H4
LAN2
JLCD1
LVDS1
LVDS2
在板背面
MSATA1
J2
J3
JP1
GPIO1
JCC1
CF1
CF1
在板背面
SATA1
PWR2
PWR1
CPUFAN1
H2
H3
FP3
FP2
FP1

2.3 架构图


EC3-1816CLD2NA (B) Function Block Diagram
VGA
DB15
D2550/ N2600 CPU
CH A
Onbord DDR3
DP to LVDS
DDI1
DMI
SATA II (1*7)
SATA1
PCI-E Port1
82583
LAN1
RJ45 Connector
SATA to CF
SATA2
PCI-E Port 2
82583
LAN2
RJ45 Connector
MSATA1
NM10
HDA
ALC892
USB 2.0 X6
USB
SPI
SPI Flash
LPC
SIO W83627UHG
LPT
GPIO
COM*4
PS/2 (K/M)
WDT
FAN

提示：如何识别跳线、接口第一脚

1、观察插头、插座旁边的文字标记，通常用“1”或加粗的线条或三角符号表示。

2、看看背面的焊盘，通常方型焊盘为第一脚。

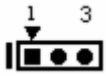
2.4 跳线设置

1. JCC1：CMOS内容清除/保持设置（脚距：2.0mm）

CMOS由板上钮扣电池供电。清CMOS会导致永久性消除以前系统配置并将其设为原始（工厂设置）系统设置。其步骤:(1)关闭计算机，断开电源；(2)瞬间短接JCC1插针；(3)开计算机；(4)启动时按屏幕提示按键进入BIOS设置，重新加载最优缺省值；(5)保存并退出设置。设置方式如下：

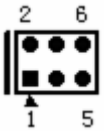
	设置	功能
JCC1	1-2 开路	正常工作状态（Default）
	1-2 短路	清除 CMOS 内容，所有 BIOS 设置恢复成出厂值

2. JP1：AT/ATX开机模式选择（脚距：2.0mm）

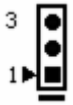
	设置	功能
 JP1	1-2 短路	AT 开机模式
	2-3 短路	ATX 开机模式（Default）

3. JP2～JP3：COM1 RS-232/ RS-485模式选择（脚距：2.0mm）

COM1支持RS-232/RS-485两种工作模式，通过跳线JP2/JP3来实现工作模式的选择。

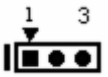
	管脚设置	模式选择	
		RS-232 (Default)	RS-485
 JP2、JP3	JP2	1-2	3-4
	JP3	1-3 2-4	3-5 4-6

4. JCF1：CF卡工作电压选择（脚距：2.0mm）

	设置	功能
 JCF1	1-2 短路	+3.3V
	2-3 短路	+5V（Default）

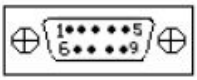
5. JLCD1：LCD工作电压选择（脚距：2.0mm）

不同的 LCD 屏电压可能不同，本板提供了 3.3V 和 5V 两种电压选择，当所选择的 LCD 电压与所使用的 LCD 屏的工作电压一致时，LCD 屏才能正常显示。设置方式如下：

	设置	功能
 JLCD1	1-2 短路	+3.3V(Default)
	2-3 短路	+5V

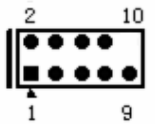
2.5 串口

1、 本板卡提供1个DB9串口，COM1支持RS-232/RS-485。

	管脚	信号名称	
		RS-232	RS-485
 COM1	1	DCD#	Data-
	2	RXD	Data+
	3	TXD	NC
	4	DTR#	NC
	5	GND	GND
	6	DSR#	NC
	7	RTS#	NC
	8	CTS#	NC
	9	RI#	NC

注：在 RS485 模式下，数据收发方向为自动控制。

2、 本主板提供3个2×5Pin的插针串口（脚距：2.0mm），管脚定义如下：

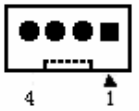


COM2～COM4

管脚	信号名称	管脚	信号名称
1	DCD#	2	RXD
3	TXD	4	DTR#
5	GND	6	DSR#
7	RTS#	8	CTS#
9	RI#	10	NA

2.6 LCD背光控制接口

本板提供1个1×4Pin 的wafer LCD背光控制接口（脚距：2.0mm），管脚定义如下：



LCDB1

管脚	信号名称
1	VCC_LCDBKLT
2	LCD_BKLTCTL
3	LCD_BKLTEN
4	GND

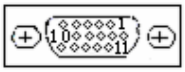
注：VCC_LCDBKLT—— +12V 背光电源（电流限制在 1A 以下）；

LCD_BKLTCTL——背光控制（该信号由 CPU 直接输出，为 PWM 信号，电压幅值 0V—3.3V，占空比在 0%～100%之间）；

LCD_BKLTEN ——背光使能，高有效（此板该信号由 CPU 直接输出，CMOS 输出，电压幅值为 0V-3.3V）。

2.7 显示接口

1、 本主板提供1个标准DB15 VGA接口，管脚定义如下：



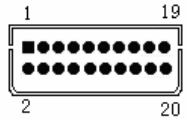
VGA1

管脚	信号名称	管脚	信号名称
1	Red	2	Green
3	Blue	4	NC
5	GND	6	GND
7	GND	8	GND
9	NC	10	GND
11	NC	12	DDCDATA
13	HSYNC	14	VSYNC
15	DDCCLK		

注意：由于Intel GMA驱动限制，在安装完显卡驱动后重启进入系统，CRT可能会成为扩展模式或者CRT不显示（此时CRT为副显），此时可通过Ctrl+Alt+F1热键进行切换，将CRT转换为主显示。

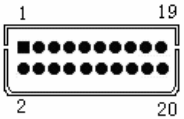
2、 LVDS接口

本板提供1个双通道24bitLVDS接口（LVDS1、LVDS2；脚距：1.0mm），使用单通道的18位/24位的LVDS屏时，LVDS数据线要接在LVDS1位置。双通道24位LVDS管脚定义如下：



LVDS1

管脚	信号名称	管脚	信号名称
1	LVDSO_D0+	2	LVDSO_D0-
3	GND	4	GND
5	LVDSO_D1+	6	LVDSO_D1-
7	GND	8	GND
9	LVDSO_D2+	10	LVDSO_D2-
11	GND	12	GND
13	LVDSO_CLK+	14	LVDSO_CLK-
15	GND	16	GND
17	LVDSO_D3+	18	LVDSO_D3-
19	VDD	20	VDD



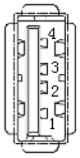
LVDS2

管脚	信号名称	管脚	信号名称
1	LVDSE_D0+	2	LVDSE_D0-
3	GND	4	GND
5	LVDSE_D1+	6	LVDSE_D1-
7	GND	8	GND
9	LVDSE_D2+	10	LVDSE_D2-
11	GND	12	GND
13	LVDSE_CLK+	14	LVDSE_CLK-
15	GND	16	GND
17	LVDSE_D3+	18	LVDSE_D3-
19	VDD	20	VDD

注：LVDSOx表示双扫描PANEL的奇数行，LVDSEx表示双扫描PANEL的偶数行。本板用到LVDS插座型号为DF20G-20DP-1V，建议使用对应端子的型号DF20A-20DF-1C。

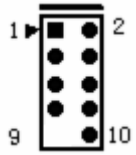
2.8 USB接口

本板提供1组双USB接口连接器（J1）和2组2×5Pin插针USB接口（J2，J3，脚距：2.0mm），共可支持6个USB设备。



J1（USB1\ USB2）

管脚	信号名称
1	+5V
2	USB_Data-
3	USB_Data+
4	GND

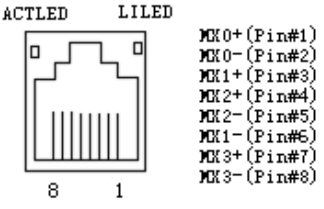


J2、J3

管脚	信号名称	管脚	信号名称
1	+5V	2	+5V
3	USB1_Data-	4	USB2_Data-
5	USB1_Data+	6	USB2_Data+
7	GND	8	GND
9	NA	10	GND

2.9 网络接口

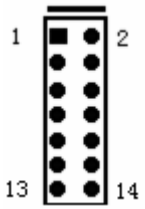
本板提供2个10/100/1000Mbps网络接口，1个是RJ45连接器LAN1，另1个是2×7的插针接口（LAN2 脚距：2.0mm）。



LAN1

ACTLED （单色:绿色灯）	网络活动 指示状态		LILED （双色：黄绿双色）	网络速度 指示状态
			绿色	1000Mbps
闪烁	有数据传输		橙色	100Mbps
灭	无数据传输		灭	10Mbps

注：千兆网卡不管有/无Link信号，左边的ACTLED灯表示的是有无数据传输，有数据传输时，左边的绿色灯应为“闪烁”状态，只连接网络未收发数据时，绿色灯应为“熄灭”状态，有广播包时，ACTLED灯“闪烁”属于正常。

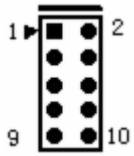


LAN2

管脚	信号名称	管脚	信号名称
1	MX0+	2	MX0-
3	MX1+	4	MX1-
5	MX2+	6	MX2-
7	MX3+	8	MX3-
9	GND	10	GND
11	LINK1000-	12	LINK100-
13	ACT_LED+	14	ACT_LED-

2.10 音频接口

本板提供1个2×5Pin的音频接口（脚距：2.0mm）。

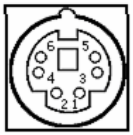


AUDIO1

管脚	信号名称	管脚	信号名称
1	LOUT_R	2	LOUT_L
3	GND_AUDIO	4	GND_AUDIO
5	LIN_R	6	LIN_L
7	GND_AUDIO	8	GND_AUDIO
9	MIC_L	10	MIC_R

2.11 鼠标键盘接口

本板提供1个Mini DIN一转二的PS/2接口。

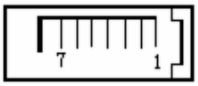


KM1

管脚	信号名称
1	KB_DATA
2	MS_DATA
3	GND
4	+5V
5	KB_CLK
6	MS_CLK

2.12 SATA接口

本主板提供1个SATA接口，1个MSATA接口（可选），选择方式可在BIOS SETUP里面设置，详见BIOS功能介绍。



SATA1

管脚	信号名称
1	GND
2	SATA_TX+
3	SATA_TX-
4	GND
5	SATA_RX-
6	SATA_RX+
7	GND

2.13 SATA硬盘热插拔

SATA 硬盘热插拔需注意：

（1） 硬盘必须支持：SATA 2.0 接口，并且采用 15 芯 SATA 硬盘电源接口。

（2） 芯片组驱动程序支持 SATA 硬盘的热插拔。

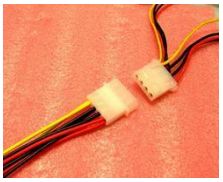
（3） 不能对操作系统所在的 SATA 硬盘进行带电热插拔。

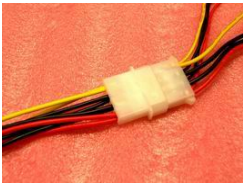
SATA 硬盘数据线

SATA 硬盘电源线

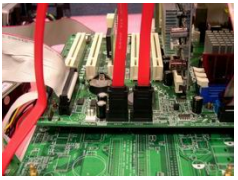
请按照如下步骤进行 SATA 硬盘热插拔，否则，操作不当会导致硬盘损坏和数据丢失。

热插入SATA硬盘步骤：





步骤1：请将SATA电源线1x4-针脚(白色)一端接到电源适配器的1x4-针脚电源线一端。



步骤2：将SATA 数据线接到主板上的SATA接口。

步骤3：将SATA电源线15-针脚接口(黑色)一端接到SATA硬盘。

步骤4：将SATA数据线接到SATA硬盘。

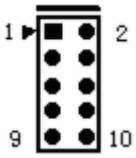
热拔出SATA硬盘步骤：

步骤 1：从设备管理器中卸载该硬盘。

步骤 2：从 SATA 硬盘一侧拔去 SATA 数据线。

步骤 3：从 SATA 硬盘一侧拔去 SATA 15-针脚电源线接口(黑色)。

2.14 GPIO 接口



GPIO1

（脚距：2.0mm）

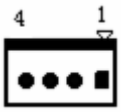
管脚	信号名称	管脚	信号名称
1	GPIO1	2	GPIO5
3	GPIO2	4	GPIO6
5	GPIO3	6	GPIO7
7	GPIO4	8	GPIO8
9	GND	10	NC

注：GPIO Default值为TTL输入/输出，输入输出信号的电压范围为0～5V，1、3、5、7脚为输入，2、4、6、8脚为输出，出厂默认状态为高5V。

2.15 风扇接口

本主板提供 1 个 1×4Pin 的 CPU 风扇接口（CPUFAN1，脚距：2.54mm）。使用风扇插座时要注意以下三点：

- 风扇电流不大于 500 毫安（12 伏特）。
- 请确认风扇接线和本插座的接线是否相符。电源线（通常为红色）在中间位置。另外就是地线（通常为黑色）和风扇转速输出脉冲信号线（其它颜色）。有些风扇没有转速检测，但该引线却有高达 12V 的输出，会损坏主板，这是非标准接线。建议使用带转速检测风扇。
- 将风扇气流调整成能将热量排出的方向。



CPUFAN1

管脚	信号名称
1	GND
2	+12V
3	FAN_IO
4	FAN_PWM

注：FAN_IO：风扇转速脉冲输出，FAN_PWM：风扇转速PWM控制。

2.16 电源接口

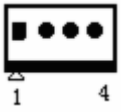
1、AT电源接口，单12V电源接口（脚距：4.2mm）

PWR1

管脚	信号名称
1	GND
2	GND
3	+12V
4	+12V

2、SATA电源转接接口

wafer 1x4P电源插座（ 白色，脚距：2.54mm）



PWR2

管脚	信号名称
1	+12V
2	GND
3	GND
4	+5V

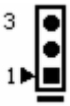
2.17 状态指示控制接口

1、电源开关及硬盘指示灯接口（脚距：2.54mm）

FP1

管脚	信号名称	管脚	信号名称
1	PWRBTN#	2	GND
3	GND	4	RESET#
5	HDD_LED-	6	HDD_LED+

2、电源指示灯接口（脚距：2.54mm）



FP2

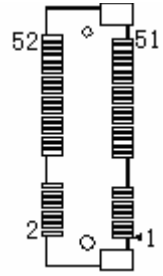
管脚	信号名称
1	PWR_LED+
2	NC
3	GND

3、扬声器输出接口（脚距：2.54mm）

FP3

管脚	信号名称
1	SPEAKER
2	NC
3	GND
4	+5V

2.18 MSATA接口



MSATA1（在板背面）

管脚	信号名称	管脚	信号名称
1	WAKE#	2	+3.3V
3	NC	4	GND
5	NC	6	+1.5V
7	CLKREQ#	8	NC
9	GND	10	NC
11	NC	12	NC
13	NC	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	W_DISABLE#
21	GND	22	NC
23	SATA_RX+	24	+3.3V
25	SATA_RX-	26	GND
27	GND	28	+1.5V
29	GND	30	NC
31	SATA_TX-	32	NC
33	SATA_TX+	34	GND
35	GND	36	NC
37	GND	38	NC
39	+3.3V	40	GND
41	+3.3V	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+1.5V
49	NC	50	GND
51	Reserved	52	+3.3V

2.19 CF卡（可选）

本主板提供CF卡可选，选择方式可通过BIOS SETUP里面设置，详见BIOS功能介绍。

CF卡是一种快速存储器，体积很小，使用方便，存储量随使用的卡变化，如128M、256M等。CF卡插入时只能以一个方向插入，板上标识为CF1，在背面。

管脚	信号名称	管脚	信号名称
1	GND	26	CD1#
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	CS0#	32	CS1#
8	GND	33	VS1#
9	ATASEL#	34	IOR#
10	GND	35	IOW#
11	GND	36	WE#
12	GND	37	IRQ
13	VCC	38	VCC
14	GND	39	CSEL#
15	GND	40	VS2#
16	GND	41	RESET#
17	GND	42	IORDY
18	A2	43	DREQ
19	A1	44	DACK#
20	A0	45	DASP#
21	D0	46	ATA66_DET
22	D1	47	D8
23	D2	48	D9
24	WP/IOCS16#	49	D10
25	CD2#	50	GND

3.BIOS功能介绍

3.1 UEFI简介

UEFI（Unified Extensible Firmware Interface：标准的可扩展固件接口），是新一代的计算机固件，用于取代传统的BIOS。UEFI固件存储在主板的闪存存储器中，主要功能包括：初始化系统硬件，设置各系统部件的工作状态，调整各系统部件的工作参数，诊断系统各部件的功能并报告故障，给上层软件系统提供硬件操作控制接口，引导操作系统等。UEFI提供用户一个菜单式的人机接口，方便用户配置各系统参数设置，控制电源管理模式，调整系统设备的资源分配等。

正确设置UEFI的各项参数，可使系统稳定可靠地工作，同时也能提升系统的整体性能。不适当的甚至错误的UEFI参数设置，则会使系统工作性能大为降低，使系统工作不稳定，甚至无法正常工作。

3.2 UEFI参数设置

每当系统接通电源，正常开机后，便可看见进入UEFI设置程序提示的信息。此时(其它时间无效)，按下提示信息所指定的按键（通常为<Del>键或<F2>键）即可进入UEFI设置程序。

通过UEFI设置程序修改的所有设置值（除了日期、时间）都保存在系统的闪存存储器中，即使掉电或拔掉主板电池，其内容也不会丢失；而日期、时间则保存在系统的CMOS存储器中，该CMOS存储器由电池供电，即使切断外部电源，其内容也不会丢失，除非执行清除CMOS内容的操作。

注意！UEFI的设置直接影响到电脑的性能，设置错误的参数将造成电脑的损坏，甚至不能开机，请使用UEFI内置缺省值来恢复系统正常运行。

由于本公司不断研发更新UEFI，其设置界面也会略有不同，以下的画面供您参考，有可能跟您目前所使用的UEFI设置程序不完全相同。

3.3 UEFI基本功能设置

当SETUP程序启动之后，您可以看到Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.主画面如下：

◆ **Main**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Main Config Advanced Monitor Boot Security Save & Exit	
Motherboard Information	Set the Date. Use 'Tab' to switch between Date elements.
Project Name EC3-1816CLD2NA(B)	
BIOS Version C00 P9173012	
Build Date 1/31/2013 10:10:10	→←: Select Screen
Processor Type	↑ ↓: Select Item
Intel(R) Atom(TM) CPU N2600 @1.60GHz	Enter: Select
	+/-: Change Opt
Memory Frequency 800 MHz(DDR3)	F1: General Help
Total Memory 2048 MB	F2: Previous Values
Power Type ATX	F3: Optimized Defaults
LAN0 MAC 00 90 27 E0 00 51	F4: Save ESC: Exit
LAN1 MAC 00 90 27 E0 00 52	
System Date [Mon 11/01/2009]	
System Time [00:47:55]	
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

➢ **System Date**

选择此选项，用< + > / < - >来设置目前的日期。以月/日/年的格式来表示。各项目合理的范围是：Month/月(1-12)，Date/日(01-31),Year/年(最大至2099)，Week/星期(Mon.～ Sun.)。

➢ **System Time**

选择此选项，用< + > / < - >来设置目前的时间。以时/分/秒的格式来表示。各项目合理的范围是：Hour/时(00-23)，Minute/分(00-59),Second/秒(00-59)。

◆ Config

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.		
Main **Config** Advanced Monitor Boot Security Save & Exit		
Power Configuration		
Restore AC Power Loss	[Last State]	→←: Select Screen
Display Configuration		↑ ↓: Select Item
IGFX – Boot Type	[CRT]	Enter: Select
DP-to-LVDS Panel Type	[800x600/18/Single]	+/-: Change Opt
LVDS BackLight Value	128	F1: General Help
Fixed Graphics Memory Size	[128MB]	F2: Previous Values
		F3: Optimized Defaults
Audio Configuration		F4: Save
Azalia Controller	[HD Audio]	ESC: Exit
USB Configuration		
UHCI #1 (ports 0 and 1)	[Enabled]	
UHCI #2 (ports 2 and 3)	[Enabled]	
UHCI #3 (ports 4 and 5)	[Enabled]	
UHCI #4 (ports 6 and 7)	[Enabled]	
USB 2.0(EHCI) Support	[Enabled]	
PCIe Root Port Configruation		
All PCIe Port	[Enabled]	
Automatic ASPM	[Manual]	
ASPM L0s	[Disabled]	
ASPM L1	[Disabled]	
Mini PCIe Slot	[Auto]	
Automatic ASPM	[Manual]	
ASPM L0s	[Disabled]	
ASPM L1	[Disabled]	
LAN Configuration		
LAN2	[Auto]	
Automatic ASPM	[Manual]	
ASPM L0s	[Disabled]	
ASPM L1	[Disabled]	
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.		

➢ **Restore AC Power Loss**

当 AC 电源断掉又供上后，期望计算机回到哪种状态的设置项。

* Power Off

S5 状态，即供上交流电后还需手动开机。

* Power On

S0 状态，即供上交流电后自动开机。

* Last State

回到 S0 还是 S5 状态，依赖于计算机断开 AC 电源时的状态。例如，断开 AC 电源时计算机处在开机状态（S0 状态），那么当重新给 AC 电源时计算机将自动开机;当断开 AC 电源时计算机已处在关机状态(S5 状态)，那么重新供给 AC 电源时不自动开机（保持 S5 状态)。

- **IGFX - Boot Type**

  设置IGD启动主显示设备

- **DP-to-LVDS Panel Type**

  用来选择板载LVDS屏的分辨率

- **LVDS BackLight Value**

  用来设置LVDS背光亮度调节

- **Fixed Grapics Memory Size**

  设置显存大小

- **Azalia Controller**

  此选项用于打开或关闭声卡控制器

- **UHCI #X (ports X and X)**

  此选项用于按控制器方式来打开或关闭

- **USB 2.0(EHCI) Support**

  此选项用于使能USB2.0

- **All PCIE Port**

  此选项打开或关闭所有PCIE port口的设备，包括网口1，网口2，Mini PCIE Slot。

- **Mini PCIE Slot**

此选项用于打开或关闭主板上的Mini PCIe Slot接口。

- **LAN2**

  此选项用于打开或关闭主板上的网口2

- **Automatic ASPM**

  此选项用于选择自动还是手动配置主板上设备的电源管理功能

- **ASPM L0s**

  此选项用于打开或关闭L0s省电功能

- **ASPM L1**

  此选项用于打开或关闭L1省电功能

◆ **Advanced**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Main Config **Advanced** Monitor Boot Security Save & Exit	
▶ CPU ▶ SATA ▶ USB ▶ COM ▶ PPM ▶ Clock Generator ▶ EVOC Features	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

➢ **CPU**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Advanced	
CPU	→←: Select Screen ↑ ↓: Select Item
Processor Type Intel(R) Atom(TM) i5 CPU	Enter: Select
EMT64 Supported	+/-: Change Opt
Processor Speed 1600 MHz	F1: General Help
System Bus Speed 400 MHz	F2: Previous Values
Ratio Status 16	F3: Optimized Defaults
Actual Ratio 16	F4: Save
System Bus Speed 400 MHz	ESC: Exit
Processor Stepping 30661	
Microcode Revision 266	
L1 Cache RAM 2x56 k	
L2 Cache RAM 2x512 k	
Processor Core Dual	
Hyper-Threading Supported	
Hyper-threading [Enabled]	
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显示CPU的相关信息。注意，CPU的Type, Speed, Core, HT等跟平台所安装的CPU有关，不同系列的CPU所显示的信息不同。

- **Hyper-Threading**

  Hyper Threading Technology功能的控制开关

➢ **SATA**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.		
Advanced		
SATA Port0	Not Present	→←: Select Screen
SATA Port1	Not Present	↑ ↓: Select Item
		Enter: Select
SATA Controller(S)	[Enabled]	+/-: Change Opt
Configure SATA as	[IDE]	F1: General Help
		F2: Previous Values
SATA Port Mode as	[mSATA Device]	F3: Optimized Defaults
HDD Latency Time	[Disabled]	F4: Save
		ESC: Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.		

SATA Port0～1动态侦测主板上有没有接SATA设备，如果对应的Port上有接设备，则显示该SATA设备的型号。否则，显示Not Present。

- **SATA Controller(S)**

  SATA控制器用来打开或关闭SATA Port上的设备

- **Configure SATA as**

  配置SATA设置的类型：IDE或AHCI

- **SATA Port Mode as**

  用来选择SATA接口是作为mSATA设备，还是CF卡

- **HDD Latency Time**

  用来增加开机阶段硬盘侦测时间

➢ USB

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Advanced	
USB Configuration USB Devices: 1 Keyboard, 1 Mouse, 2 Hubs Legacy USB Support [Enabled]	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

- Legacy USB Support

此选项用于支持传统的USB设备（键盘，鼠标，存储设备等），当该项设为Enabled时，即使不支持USB的操作系统如DOS下也能使用USB设备。当设置成Disabled时，传统设备在不支持USB的操作系统中将不可用。

注意：EFI application下USB仍然可用，如Shell下。

➢ COM

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Advanced	
COM ►Serial Port 0 Configuration ►Serial Port 1 Configuration ►Serial Port 2 Configuration ►Serial Port 3 Configuration	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

- Serial Port 0～3 Configuration

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Advanced	
Serial Port 0～3 Configuration Serial Port [Enabled] Device Settings IO=3F8h; IRQ=4; Change Settings [Auto]	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

*** Serial Port0～3**

此项用于打开或关闭当前串口

*** Device Settings**

此项用于显示串口当前的资源配置

*** Change Settings**

此项用于配置串口所用的资源（IO和IRQ）

- **PPM**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Advanced	
PPM Configration EIST [Enabled]	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

- **EIST**

  此项是支持Intel的CPU频率可调节功能

➢ **Clock Generator**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Advanced	
Clock Generator Spread Spectrum [Disabled]	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

- Spread Spectrum

  此选项用于设置时钟信号的展频功能

➢ **EVOC Features**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Advanced	
EVOC Features FMI Configuration [Enabled] Time Record Support [Enabled] eDisk Support [Disabled] eLogo Support [Disabled]	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
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- **FMI Configuration**

  此项是总开关，用来控制是否支持EVOC Features

- **Time Record Support**

  此项用来记录主板运行时长

- **eDisk Support**

  此项用来打开或关闭虚拟磁盘

- **eLogo support**

  此项用来在线更换开机Logo，只有当eDisk Support是enabled时，该功能才能实现

◆ **Monitor**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.		
Main Config Advanced **Monitor** Boot Security Save & Exit		
PC Health Status		→←: Select Screen ↑ ↓: Select Item
System Temperature	: +26 C	Enter: Select
CPU Temperature	: +57 C	+/-: Change Opt
CpuFan Speed	: N/A	F1: General Help
Vcore	: +1.152 V	F2: Previous Values
V3.3	: +3.328 V	F3: Optimized Defaults
V5.0	: +5.058 V	F4: Save
V12.0	: +12.091 V	ESC: Exit
VBAT	: +3.296 V	
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显示当前所侦测到得硬件的电压，温度，风扇转速等监控信息。

- **System Temperature**

  当前系统温度，一般主板上有热敏电阻监测。

- **CPU Temperature**

  当前CPU温度。CPU的温度由板上的温度传感器监测。

- **CpuFan Speed**

  当前CPU风扇转速

- **Vcore**

  CPU核心电压

- **V3.3/ V5.0/V12.0**

  开关电源输出电压

- **VBAT**

  CMOS电池电压

◆ **Boot**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Main Config Advanced Monitor **Boot** Security Save & Exit	
Boot Configuration Quiet Boot [Disabled] **Boot Option Priorities** Boot Option #1 [Built-in EFI Shell] ► **Special Boot Order Configuration**	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
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- **Quiet Boot**

  Boot模式选择开关，用于打开或关闭Quiet Boot功能。

- **Boot Option Priorities**

  此项用于配置系统引导的优先次序。其中#1优先级最高，#n优先级最低。

➢ Special Boot Order Configuration

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Boot	
Special Boot Order Configuration Special Boot Order Configuration [Disabled]	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3:Optimized Defaults F4: Save ESC: Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

● Special Boot Order Configuration

此项用于配置传统设备在BBS中的优先次序

◆ Security

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Main Config Advanced Monitor Boot **Security** Save & Exit	
Password Description If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights. Administrator Password User Password	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

➢ **Setup Administrator Password**

此项用于设置管理员密码

注：如果只设置管理员密码，则只当进入Setup设置程序时需要输入管理员密码。

◆ **Save & Exit**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Main Config Advanced Monitor Boot Security **Save & Exit**	
Save Changes and Reset Discard Changes and Reset	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
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➢ **Save Changes and Reset**

此项用于保存修改并重启

➢ **Discard Changes and Reset**

此项用于放弃所作修改并重启

3.4 x86 平台下UEFI所要管理的系统资源

这里的系统资源我们定义三种：I/O端口地址，IRQ中断号和DMA号。

◆ DMA

级别	功能
DMA0	未分配
DMA1	未分配
DMA2	未分配
DMA3	未分配
DMA4	用于 DMAC 的级联
DMA5	未分配
DMA6	未分配
DMA7	未分配

◆ APIC

高级可编程中断控制器。在现代P4以上级别的主板中，大都支持APIC，可以提供多于16个中断源，如IRQ16—IRQ23，部分主板如支持PCI-X的主板可以有多达28个中断源。但要启用该功能必须相应的操作系统支持。

◆ IO端口地址

X86的I/O地址线只设计16条，从0～0FFFFh，I/O地址空间总共有64K，在传统的ISA接口，只使用到前面的1024个（0000～03FFh），0400h以上的端口为PCI接口与EISA接口所使用。每一外围设备都会占用一段I/O地址空间。下表给出了X86平台大致上所要用到的I/O接口列表。

地　址	设备描述
000h - 001Fh	DMA 控制器#1
020h - 021h	可编程中断控制器
040h - 043h	系统计时器
060h - 060h	PS/2 标准键盘
064h - 064h	PS/2 标准键盘
070h - 071h	系统 CMOS/实时时钟
081h - 091h	DMA 控制器
0A0h - 0A1h	可编程中断控制器
0C0h - 0DFh	DMA 控制器
0F0h - 0FFh	数据数值处理器
2E8h - 2EFh	通信端口 4
2F8h - 2FFh	通信端口 2
3B0h - 3BBh	Intel(R) Graphic Media Accelerator
3C0h - 3DFh	Intel(R) Graphic Media Accelerator
3E8h - 3EFh	通信端口 3
3F8h - 3FFh	通信端口 1
4D0h - 4D1h	可编程中断控制器
D00h - FFFFh	PCI Bus

◆ **IRQ中断分配表**

系统共0有15个中断源，有些已被系统设备独占。只有未被独占的中断才可分配给其它设备使用。ISA设备要求独占使用中断；只有即插即用ISA设备才可由UEFI或操作系统分配中断。而多个PCI设备可共享同一中断，并由UEFI或操作系统分配。下表给出了X86平台部分设备的中断分配情况，但没有给出PCI设备所占用的中断资源。

级别	功能
IRQ0	系统计时器
IRQ1	标准 101/102 键或 Microsoft 键盘
IRQ2	保留
IRQ3	通信端口 2
IRQ4	通信端口 1
IRQ5	保留
IRQ6	保留
IRQ7	通信端口 3 4
IRQ8	系统 CMOS/实时时钟
IRQ9	保留
IRQ10	保留
IRQ11	保留
IRQ12	PS/2 鼠标
IRQ13	数据数值处理器
IRQ14	保留
IRQ15	保留

4.驱动程序安装说明

本产品的驱动程序可依据配套光盘内容安装，在此不做介绍。

5.附录

5.1 BPI功能介绍

EVOC BPI(BIOS Programming Interface)是一种跨平台的，易维护的，支持操作系统保护模式下访问硬件的软件接口规范。本产品的功能是为应用层软件或驱动提供统一的标准接口，在主板硬件升级时，无需修改应用层软件或驱动，原来的软件就可在新的平台上正常运行。大大提高产品的开发速度和降低产品的维护成本。目前 BPI 支持 WDT，GPIO 的配置及 H/W monitor 功能，其测试程序及库函数等相关文档详见说明书光盘。

BPI 具有如下特点：

1、 平台无关性

使用 BPI 库函数开发的软件，无需做任何修改，就可直接在支持 BPI 功能的新平台上正常运行。

2、 安全性和可靠性高

访问硬件的 BPI 库函数由主板开发商编写，并经过严格测试，可避免因对系统硬件操作不当，造成系统异常问题。

3、 配置灵活

如 GPIO 配置，通过 BPI 库函数或测试程序，用户可很方便地配置任意一个 GPIO 功能。

4、 易维护

传统方式的 WDT 及 GPIO 编程与硬件密切相关，测试及调试复杂，且需要维护不同平台的软件，而使用 BPI 开发的软件，只要维护一套软件即可。

5、 成本低

用户使用 BPI 开发应用程序，不会增加额外的硬件和软件成本。相反会大大降低软件开发难度，缩短开发周期，可帮助系统集成商产品快速上市。

5.2 常见故障分析与解决

常见故障	检查点
通电之后不开机	1. 请确认电源连接线是否连接正常 2. 请确认所用电源是否满足主板的供电要求 3. 查看CPU是否安装到位，CPU卡扣是否扣好 4. 尝试重新插拔内存条 5. 尝试更换内存条 6. 尝试根据主板说明书清除主板CMOS 7. 请确认是否有外接卡，去除外接卡后是否正常
BIOS Setup设置不能保存	1. 请确认CMOS电池电压是否低于2.8V，如低于2.8V，请更换新电池，重新设置保存
提示无法找到可引导设备	1. 请确认硬盘电源线、数据线是否连接正常 2. 请确认硬盘是否有物理损坏 3. 请确认硬盘中是否正常安装操作系统
进入系统过程中蓝屏或死机	1. 请确认内存条及外接卡是否松动 2. 尝试去掉新安装的硬件，卸载驱动或软件 3. 尝试更换内存
进入操作系统缓慢	1. 尝试使用第三方软件检查硬盘是否有坏道 2. 请确认系统所在分区剩余空间是否过少 3. 请确认 CPU 散热风扇是否正常转动
系统自动重启	1. 请确认 CPU 散热风扇是否正常转动 2. 请确认是否误触发工控机复位按钮 3. 请使用杀毒软件确认系统是否感染病毒 4. 请确认内存条及外接卡是否松动 5. 请确认所用电源带载能力是否足够，可尝试更换电源

无法检测到USB设备	1. 请确认 USB 设备是否需要单独供电 2. 请确认 USB 接口是否存在接触不良 3. 请确认 BIOS Setup 中 USB 控制器是否打开
无法检测到PCI卡	1. 请确认 PCI 卡是否需要额外供电 2. 请确认 PCI 卡工作所需电压与主板 PCI 提供电压（默认 5V）是否相符 3. 请确认更换 PCI 槽位后能否被识别
无法检测到ISA卡	1. 依据 ISA 卡手册确定 ISA 卡所使用的资源已经被 BIOS 预留--大部分主板 BIOS Setup 中有针对 ISA 使用 I/O 或 memory 资源的预留选项，ISA 卡所使用的 IRQ 是否在 BIOS Setup 中被 reserved 2. ISA 卡一般在系统下无法直接识别，Windows 系统需在“控制面板”中选择“添加硬件”进行添加

Legal Information

Warnings

Please pay attention to the tips within the manual so as to avoid personal injury or property losses. The tips for personal injury are indicated in warning triangles while the tips only related to property losses have no warning triangles. The warning tips are listed as follows with the hazardous scale from severe to slight.

⚠ **Danger**
If handled carelessly, death or severe human injury will occur.

⚠ **Warning**
If handled carelessly, death or severe human injury might occur.

⚠ **Caution**
Warning triangle indicates that slight human injury might occur if handled carelessly.

Note
Unexpected result or status might occur, if not handled according to the tips.

Professional Personnel

The product/system covered by the manual can only be handled by qualified and professional personnel. During operation, please follow the respective instructive manuals, especially the safety warnings. The professional personnel have been trained and possess relevant experiences; therefore, he/she could be aware of the risks of the product/system and avoid possible damages.

EVOC Product

Please pay attention to the following instructions:

⚠ **Warning**
EVOC product can only be used according to the descriptions within the manual, including the contents and the relevant technical documents. If the products or components from other companies are required, please get the recommendation and grant from EVOC first. Proper transportation, storage, assembly, installation, debugging, operation and maintenance are prerequisite to ensure product safety and normal operation; therefore, please ensure permitted environment conditions and pay attention to the tips within the manual.

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Warranty Terms:

The warranty on the product lasts for one year. If the user has additional requirements, the contract signed between the two sides shall prevail.

Please visit our website: http://www.evoc.com for more information,
or send an email to the Technical Support Mailbox support@evoc.com (International) or support@evoc.cn (Domestic) for consultation.

Hotline: 4008809666

About this manual

Scope of the Manual

The manual is appropriate for EVOC EC3-1816CLD2NA(B).

Convention

The term “the PC” or “the Product” within the manual usually stands for EVOC EC3-1816CLD2NA(B).

Instructions

Safety instructions

To avoid property losses or individual injury, please pay attention to the safety instructions within the manual. The warnings within the manual are marked with warning triangle ⚠, whose existence is dependent upon the scale of the potential hazard.

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1. Product Introduction

1.1 Overview

This motherboard contains Intel® Atom™D2550/N2600 + NM10 chipset (EC3-1816CLD2NA(B)-DW contains Intel® Atom™ D2550 + NM10 chipset, EC3-1816CLD2NA(B)-N2600 contains Intel® Atom™ N2600 + NM10 chipset), D2550 is 1M Cache 1.86GHz，N2600 is 1M Cache 1.6GHz；supports onboard 2GB DDR3 memory (EC3-1816CLD2NA(B)-DW motherboard supports onboard 1066MHz 2GB memory; EC3-1816CLD2NA(B)-N2600 motherboard supports onboard 800MHz 2GB memory). The motherboard supports VGA and LVDS displays, single or dual-display, and onboard two 10/100/1000Mbps network ports. This board provides multiple external ports, including one SATA interfaces , one MSATA interfaces (optional) and one CF card (optional), MSATA and CF cannot be used simultaneously ,the selection method can be set in BIOS SETUP; six USB 2.0 ports, four COM ports (COM1 supports RS-232/RS-485), and standard MIC-IN/LINE-IN/LINE-OUT audio ports.

1.2 Mechanical Dimensions, Weight and Environment

- Dimensions (with heat sink):
  EC3-1816CLD2NA(B)-DW：146.1mm(L) x 101.6mm(W) x28mm(H)
  EC3-1816CLD2NA(B)-N2600：146.1mm(L) x 101.6mm(W) x 33mm(H)
- Net weight:0.19Kg;
- Operating environment:
  EC3-1816CLD2NA(B)-DW:
  Temperature: 0℃～60℃; extendable to: -40℃～80℃
  Humidity: 5 %～95% (non-condensing)
  EC3-1816CLD2NA(B)-N2600:
  Temperature: 0℃～60℃; extendable to: -40℃～85℃
  Humidity: 5%～95% (non-condensing)
- Storage environment:
  Temperature: -40℃～80℃
  Humidity: 5%～95% (non-condensing)

1.3 Typical Consumption

The typical consumption is calculated based on the following configuration under idle status.

EC3-1816CLD2NA(B)-DW

CPU：Onboard Intel® Atom ™ CPU D2550 @ 1.86GHz

Memory: Onboard Samsung/DDRIII 1066/2G

- +12V@0.9A；+5%/-3%；

EC3-1816CLD2NA(B)-N2600

CPU：Onboard Intel® Atom ™ CPU N2600 @ 1.60GHz

Memory: Onboard Samsung/DDRIII 1066/2G

- +12V@0.68A；+5%/-3%；

1.4 Microprocessor

Onboard Intel® Atom™ D2550 (dual-core) 1M Cache 1.86GHz/N2600/N2600 (dual-core) 1M Cache 1.6GHz processor, Micro-FCBGA11 package.

1.5 Chipset

Intel® ATOM™ D2550/N2600 + NM10.

1.6 System Memory

Onboard 2GB DDR3 memory, EC3-1816CLD2NA(B)-DW supports 1066MHz memory; EC3-1816CLD2NA(B)-N2600 supports 800MHz memory.

1.7 Display

- Supports VGA and LVDS display; VGA supports hot swap; all are sync output;
- The maximum resolution and refresh rate supported by VGA is 1920×1200@60Hz, and that supported by LVDS is 1920×1080@60HZ.

1.8 Network

Provides two 10/100/1000Mbps network ports; LAN1 supports Wake-On-LAN.

1.9 Audio

HDA standard, supporting MIC-IN/LINE-IN/LINE-OUT.

Note: Analog ATX power bootup mode by default. If AT bootup mode needs to be used, please refer to 2.4.2 in User Manual for corresponding jumper setting.

1.10 Power Feature

Single 12V power supply.

1.11 Watchdog

- 255 levels, programmable by minute or second;
- Supports watchdog timeout interrupt or reset system.

1.12 Operating System

Supported operating systems: WINCE/WINXP/WINXPE/WIN7/Linux

1.13 I/O Ports

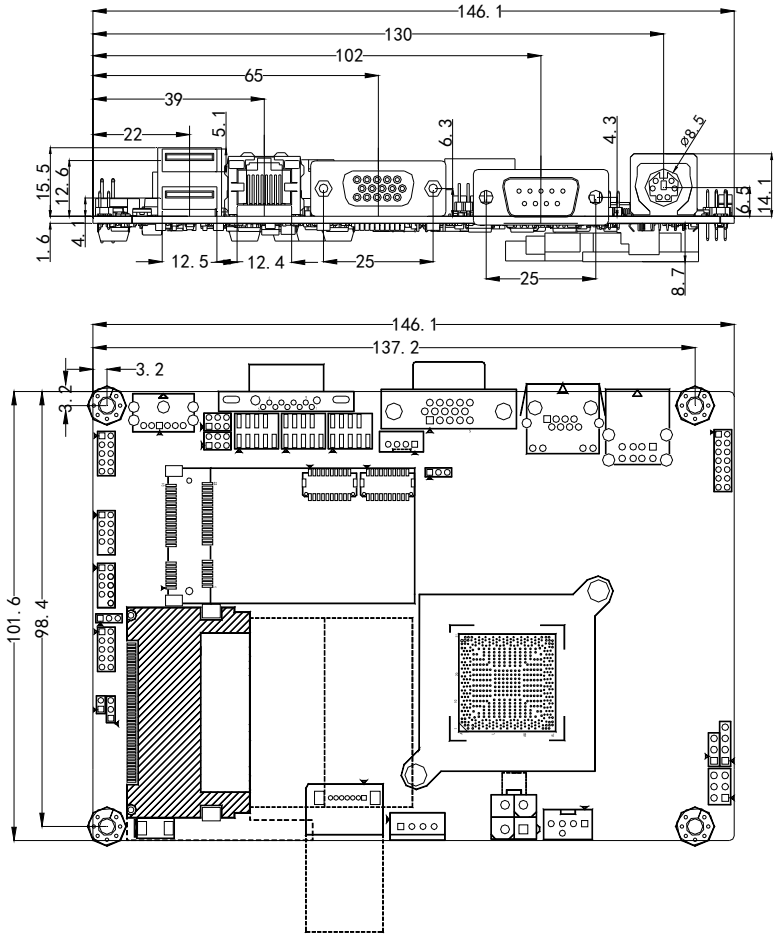
- 4 x COM port; COM1 supports RS-232/RS-485 mode selection;
- 1 x SATA interface, 1 x MSATA interface (optional) or 1 x CF card slot (optional). (MSATA or CF card can be selected via "Advanced"-"SATA"--"SATA port Mode as" in BIOS.)
- 6 x USB2.0 port;
- 1 x PS/2 keyboard/mouse port;
- 1 x 8-channel digital I/O port.

Tips: How to identify alarms

1. A long beep indicates a system memory error.
2. A short beep means to power on the product.

2. Installation Instructions

2.1 Product Dimensions Drawing

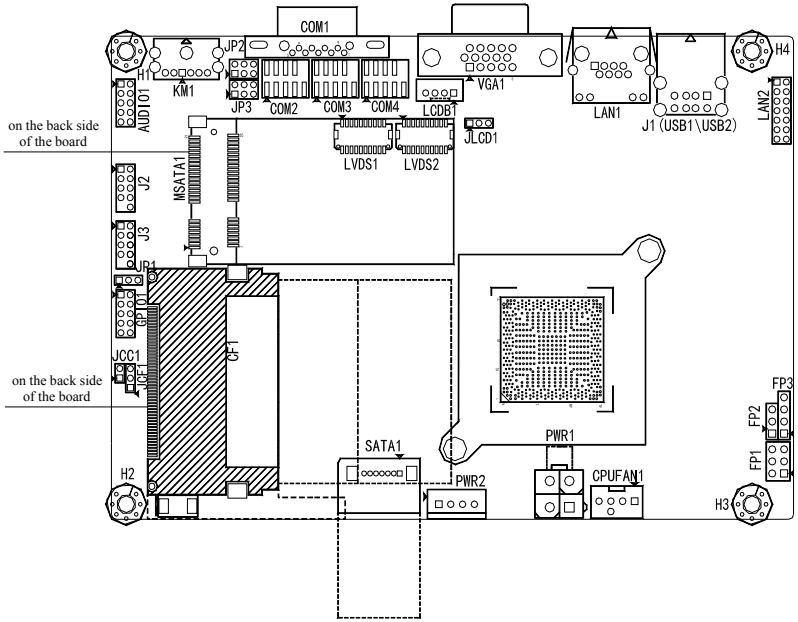


Unit: mm

Warning!

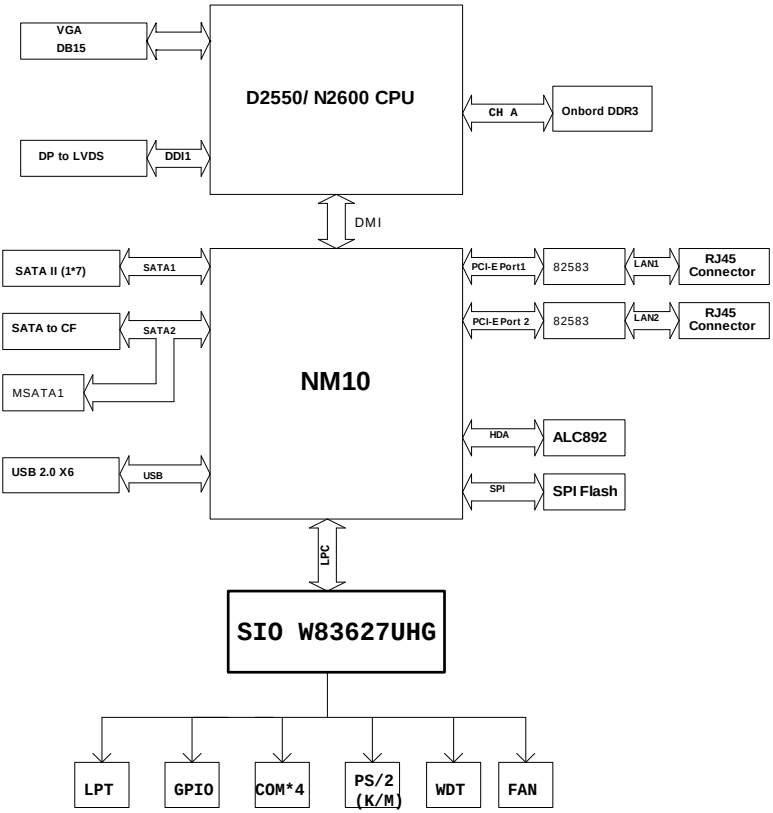
Please adopt appropriate screws and proper installation methods (including board allocation, CPU and heat sink installation, etc); otherwise, the board may be damaged. It is recommended to use M3x6 GB9074.4-88 screws at H1 ~ H4.

2.2 Port Location



2.3 Structure Diagram

EC3-1816CLD2NA (B) Function Block Diagram



Tip: How to identify the first pin of the jumpers and connectors

1. Observe the letter beside the socket: the first pin is usually marked with "1" or bold lines or triangular symbols;
2. Observe the solder pad on the back: usually the square pad is the first pin.

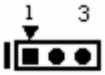
2.4 Jumper Setting

1. JCC1: Clear/Keep CMOS Setting (Pitch: 2.0mm)

CMOS is powered by the button battery on board. Clearing CMOS will restore original settings (factory default). The steps are listed as follows: (1) Turn off the computer and unplug the power cable; (2) Instantly short circuit JCC1; (3) Turn on the computer; (4) Follow the prompt on screen to enter BIOS setup when booting the computer, load optimized defaults; (5) Save and exit. Please set as follows:

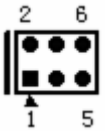
	Setup	Function
JCC1	1-2 Open	Normal ((Default)
	1-2 Short	Clear the contents of CMOS and all BIOS settings will restore to factory default values.

2. JP1: AT/ATX Power-on Mode Selection (Pitch: 2.0mm)

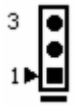
	Setup	Function
 JP1	1-2 Open	AT power-on mode
	2-3 Short	ATX power-on mode (Default)

3. JP2～JP3: COM1 RS-232/ RS-485 Mode selection (Pitch: 2.0mm)

COM1 supports two operating modes: RS-232/RS-485. The mode selection can be realized by setting JP2/JP3.

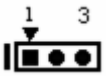
	Pin Setting	Mode Selection	
		RS-232 (Default)	RS-485
 JP2, JP3	JP2	1-2	3-4
	JP3	1-3 2-4	3-5 4-6

4. JCF1: CF Card Operating Voltage Selection (Pitch: 2.0mm)

	Setup	Function
 JCF1	1-2 Short	+3.3V
	2-3 Short	+5V（Default）

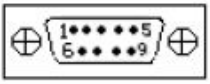
5. JLCD1: Select LCD Operating Voltage (Pitch: 2.0mm)

Different LCD screens have different voltages; the board provides two voltage options, +3.3V and +5V. Only when the selected LCD voltage is in accord with the LCD screen operating voltage in use, can the LCD screen operate normally. Please set as follows:

	Setup	Function
 JLCD1	1-2 Short	+3.3V(Default)
	2-3 Short	+5V

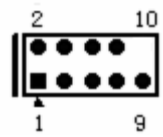
2.5 COM Port

1. The board provides one DB9 COM port. The COM1 supports RS-232/RS-485.

	Pin	Signal	
		RS-232	RS-485
 COM1	1	DCD#	Data-
	2	RXD	Data+
	3	TXD	NC
	4	DTR#	NC
	5	GND	GND
	6	DSR#	NC
	7	RTS#	NC
	8	CTS#	NC
	9	RI#	NC

Note: Under RS-485 mode, the data transmission direction is controlled automatically.

2. This motherboard provides three 2×5Pin COM ports (pitch: 2.0mm). Their pin definitions are as follows:

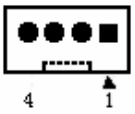


COM2～COM4

Pin	Signal	Pin	Signal
1	DCD#	2	RXD
3	TXD	4	DTR#
5	GND	6	DSR#
7	RTS#	8	CTS#
9	RI#	10	NA

2.6 LCD Backlight Control Connector

This board provides one 1×4Pin wafer LCD backlight control connector (pitch: 2.0mm). Its pin definitions are as follows:



LCDB1

Pin	Signal
1	VCC_LCDBKLT
2	LCD_BKLTCTL
3	LCD_BKLTEN
4	GND

Notes:

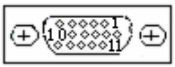
VCC_LCDBKLT--- backlight power (+12V); the current should be limited below 1A.

LCD_BKLTCTL--- backlight control (The signal is output directly from CPU, and is PWM signal; voltage amplitude 0V—3.3V, duty cycle is within 0-100%);

LCD_BKLTEN --- backlight enabling signal, active high. (The signal is output directly from CPU, CMOS output, voltage amplitude 0V-3.3V.)

2.7 Display Port

1. This motherboard provides one standard DB15 VGA port. Its pin definitions are as follows:



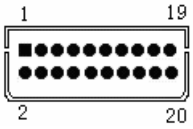
VGA1

Pin	Signal	Pin	Signal
1	Red	2	Green
3	Blue	4	NC
5	GND	6	GND
7	GND	8	GND
9	NC	10	GND
11	NC	12	DDCDATA
13	HSYNC	14	VSYNC
15	DDCCLK		

Note: Due to Intel GMA driver limitation, the CRT may become extended mode or not have signal to it (the CRT is secondary display) after restarting from the graphics driver installation. To work out this limitation, press the Ctrl+Alt+F1 hotkey to switch the CRT mode to primary display.

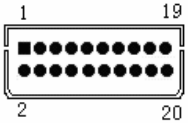
2. LVDS port

This board provides one dual-channel 24bitLVDS port (LVDS1, LVDS2; pitch: 1.0mm). If single-channel 18-bit/24-bit LVDS screen is used, LVDS data cable must be connected to LVDS1. The pin definitions of dual-channel 24-bit LVDS are as follows:



LVDS1

Pin	Signal	Pin	Signal
1	LVDSO_D0+	2	LVDSO_D0-
3	GND	4	GND
5	LVDSO_D1+	6	LVDSO_D1-
7	GND	8	GND
9	LVDSO_D2+	10	LVDSO_D2-
11	GND	12	GND
13	LVDSO_CLK+	14	LVDSO_CLK-
15	GND	16	GND
17	LVDSO_D3+	18	LVDSO_D3-
19	VDD	20	VDD



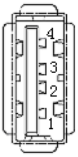
LVDS2

Pin	Signal	Pin	Signal
1	LVDSE_D0+	2	LVDSE_D0-
3	GND	4	GND
5	LVDSE_D1+	6	LVDSE_D1-
7	GND	8	GND
9	LVDSE_D2+	10	LVDSE_D2-
11	GND	12	GND
13	LVDSE_CLK+	14	LVDSE_CLK-
15	GND	16	GND
17	LVDSE_D3+	18	LVDSE_D3-
19	VDD	20	VDD

Note: LVDSOx refers to the odd lines of dual-scan PANEL, and LVDSEx refers to the even lines of dual-scan PANEL. The model of LVDS socket used by this motherboard is DF20G-20DP-1V, and the recommended corresponding terminal is DF20A-20DF-1C.

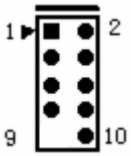
2.8 USB Port

This board provides one dual-USB port connector (J1) and two 2x5Pin USB ports (J2, J3, pitch: 2.0mm), supporting six USB devices. Their pin definitions are as follows:



J1（USB1\ USB2）

Pin	Signal
1	+5V
2	USB_Data-
3	USB_Data+
4	GND

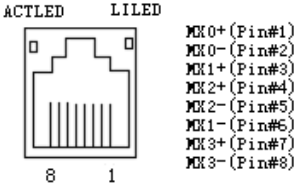


J2、J3

Pin	Signal	Pin	Signal
1	+5V	2	+5V
3	USB1_Data-	4	USB2_Data-
5	USB1_Data+	6	USB2_Data+
7	GND	8	GND
9	NA	10	GND

2.9 LAN Port

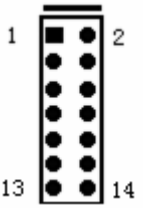
The motherboard provides two 10/100/1000Mbps LAN ports: one is a RJ45 connector LAN1, the other is a 2×7 pin header (LAN2, pitch: 2.0mm).



LAN1

ACTLED (Single color: green)	LAN Activity Status Indicator		LILED (Dual-Color: orange/green)	LAN Speed Indicator
			Green	1000Mbps
Flash	Data being transmitted		Orange	100Mbps
Off	No Data being transmitted		Off	10Mbps

Note: no matter the Gigabit LAN card contains Link signal or not, the ACTLED on the left always indicates the data transmission status. When data is being transmitted, the green LED on the left is “flashing”; when it is connected to network with no data transmission, the green LED is “off”; when there are broadcasting packages, it is normal if the ACTLED is “flashing”.

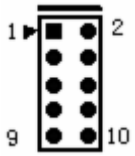


LAN2

Pin	Signal	Pin	Signal
1	MX0+	2	MX0-
3	MX1+	4	MX1-
5	MX2+	6	MX2-
7	MX3+	8	MX3-
9	GND	10	GND
11	LINK1000-	12	LINK100-
13	ACT_LED+	14	ACT_LED-

2.10 Audio Port

This board provides one 2×5Pin audio port (pitch: 2.0mm).

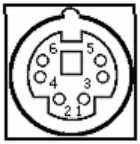


AUDIO1

Pin	Signal	Pin	Signal
1	LOUT_R	2	LOUT_L
3	GND_AUDIO	4	GND_AUDIO
5	LIN_R	6	LIN_L
7	GND_AUDIO	8	GND_AUDIO
9	MIC_L	10	MIC_R

2.11 Mouse/Keyboard Port

This board provides one Mini DIN 1-to-2 PS/2 port.



KM1

Pin	Signal
1	KB_DATA
2	MS_DATA
3	GND
4	+5V
5	KB_CLK
6	MS_CLK

2.12 SATA Interface

This motherboard provides one SATA interfaces , one MSATA interfaces (optional), and the selection method can be set in BIOS SETUP. Please refer to BIOS Setup part for detailed information.

SATA1

Pin	Signal
1	GND
2	SATA_TX+
3	SATA_TX-
4	GND
5	SATA_RX-
6	SATA_RX+
7	GND

2.13 SATA HDD Hot Plugging

Notes for hot-swap of SATA hard disk:

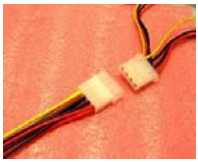
1. The hard disk shall support SATA 2.0 and use 15-pin SATA hard disk power connector.
2. The driver of chipset shall support the hot-swap of SATA hard disk.
3. Hot-swap of SATA hard disk where the operating system is located is forbidden when system is powered-on.

SATA Data Cable

SATA Power Cable

Please carry out hot plugging as follows. Improper operation may destroy the hard disk or result in data loss.

SATA HDD Hot Plugging Steps



Step 1: Please connect the 1 x 4 pin SATA power connector (white) with the 1x4-pin power cable of power adapter.

Step 2: Please connect the SATA data cable to the SATA connector on the motherboard.

Step 3: Please connect the 15-pin SATA power connector (black) to the SATA hard disk.

Step 4: Please connect the SATA data cable to the SATA hard disk.

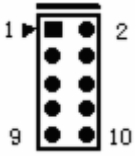
SATA HDD Hot Unplugging Steps

Step 1: Uninstall the hard disk from the device manager.

Step 2: Unplug the data cable from the SATA hard disk.

Step 3: Unplug the SATA 15-pin power connector (black) from the SATA hard disk.

2.14 GPIO Port



GPIO1

(Pitch: 2.0mm)

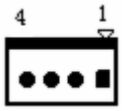
Pin	Signal	Pin	Signal
1	GPIO1	2	GPIO5
3	GPIO2	4	GPIO6
5	GPIO3	6	GPIO7
7	GPIO4	8	GPIO8
9	GND	10	NC

Note: GPIO Default is TTL input/ output and the voltage range for input/output signal is 0-5V. The pin 1, 3, 5 and 7 are input, while pin 2, 4, 6, and 8 are output. The factory default state is high 5V.

2.15 Fan Connector

The motherboard provides one 1×4Pin CPU fan connector (CPUFAN1, pitch: 2.54mm). When using the fan connector, please pay attention to the following two issues:

- The current for the fan should be no more than 500mA (12v).
- Please confirm that the fan cable complies with the socket cable. Power cable (usually red) is in the middle. In addition, please confirm the position of earth cable (usually black) and fan speed output pulse signal cable (other colors). Some fans have no speed detection while the output of the cable is up to 12V. These substandard connection will damage the CPU card. It is recommended to use a fan with speed detection.
- Adjust the fan's airflow to the direction of heat venting.



CPUFAN1

Pin	Signal
1	GND
2	+12V
3	FAN_IO
4	FAN_PWM

FAN_IO: fan speed pulse output; FAN_PWM: fan speed PWM control.

2.16 Power Connector

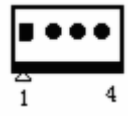
1. AT power connector, single 12V power connector (pitch: 4.2mm)

PWR1

Pin	Signal
1	GND
2	GND
3	+12V
4	+12V

2. SATA power connector

Wafer 1x4P power connector (white, pitch: 2.54mm)

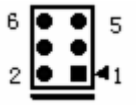


PWR2

Pin	Signal
1	+12V
2	GND
3	GND
4	+5V

2.17 Status Indicating and Control Connectors

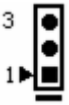
1. Power switch and HDD indicator ports (Pitch: 2.54mm)



FP1

Pin	Signal	Pin	Signal
1	PWRBTN#	2	GND
3	GND	4	RESET#
5	HDD_LED-	6	HDD_LED+

2. Power indicator port (Pitch: 2.54mm)



FP2

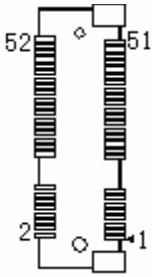
Pin	Signal
1	PWR_LED+
2	NC
3	GND

3. Speaker output port (Pitch: 2.54mm)

FP3

Pin	Signal
1	SPEAKER
2	NC
3	GND
4	+5V

2.18 MSATA Port



MSATA1 (on the back side of the board)

Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3V
3	NC	4	GND
5	NC	6	+1.5V
7	CLKREQ#	8	NC
9	GND	10	NC
11	NC	12	NC
13	NC	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	W_DISABLE#
21	GND	22	NC
23	SATA_RX+	24	+3.3V
25	SATA_RX-	26	GND
27	GND	28	+1.5V
29	GND	30	NC
31	SATA_TX-	32	NC
33	SATA_TX+	34	GND
35	GND	36	NC
37	GND	38	NC
39	+3.3V	40	GND
41	+3.3V	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+1.5V
49	NC	50	GND
51	Reserved	52	+3.3V

2.19 CF Card (optional)

This motherboard provides CF card (optional), which can be set in the BIOS SETUP. Please refer to BIOS Setup part for detailed information.

CF card is a sort of high speed memory, small in size and easy to use. The storage capacity varies with different cards in use, such as 128M, 256M. CF card could only be inserted in one direction and it is marked as CF1 on the back of the board.

Pin	Signal	Pin	Signal
1	GND	26	CD1#
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	CS0#	32	CS1#
8	GND	33	VS1#
9	ATASEL#	34	IOR#
10	GND	35	IOW#
11	GND	36	WE#
12	GND	37	IRQ
13	VCC	38	VCC
14	GND	39	CSEL#
15	GND	40	VS2#
16	GND	41	RESET#
17	GND	42	IORDY
18	A2	43	DREQ
19	A1	44	DACK#
20	A0	45	DASP#
21	D0	46	ATA66_DET
22	D1	47	D8
23	D2	48	D9
24	WP/IOCS16#	49	D10
25	CD2#	50	GND

3. BIOS Setup

3.1 UEFI Overview

UEFI (Unified Extensible Firmware Interface) is the latest computer firmware to replace traditional BIOS. UEFI is solidified in the flash memory on the CPU board. Its main functions include: initialize system hardware, set the operating status of the system components, adjust the operating parameters of the system components, diagnose the functions of the system components and report failures, provide hardware operating and control interface for the upper level software system, guide operating system and so on. UEFI provides users with a human-computer interface in menu style to facilitate the configuration of system parameters for users, control power management mode and adjust the resource distribution of system device, etc.

Setting the parameters of the UEFI correctly can enable the system to operate stably and reliably; meanwhile it can also improve the overall performance of the system. Improper even incorrect UEFI parameter setting will decrease the system operating capability and make the system unstable even unable to operate normally.

3.2 UEFI Parameter Setup

Prompt message for BIOS setting may appear once powering on the system. At that time (invalid at other time), press the key specified in the prompt message (usually <Del> or <F2>) to enter UEFI setting.

All the setup values modified by UEFI (excluding date and time) are saved in the flash storage in system; the contents will not be lost even if power is disconnected or the battery of the board is removed. The date and time are saved in CMOS storage, which is powered by battery; unless clearing CMOS is executed, its content would not be lost even if external power is cut off.

Note: UEFI setting will influence the computer performance directly. Setting parameter improperly will cause damage to the computer; it may even be unable to power on. Please use the internal default value of UEFI to restore the system.

Our company is constantly researching and updating UEFI, its setup interface may be a bit different. The figure below is for reference only; it may be different from your UEFI setting in use.

3.3 Basic Function Setting for UEFI

After starting SETUP program, the main interface of Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc. will appear as below

◆ **Main**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc. Copyright (C)	
Main Config Advanced Monitor Boot Security Save & Exit	
Motherboard Information Project Name EC3-1816CLD2NA(B) BIOS Version C00 P9173012 Build Date 1/31/2013 10:10:10 Processor Type Intel(R) Atom(TM) CPU N2600 @1.60GHz Memory Frequency 800 MHz(DDR3) Total Memory 2048 MB Power Type ATX LAN0 MAC 00 90 27 E0 00 51 LAN1 MAC 00 90 27 E0 00 52 System Date [Mon 11/01/2009] System Time [00:47:55]	Set the Date. Use'Tab' to switch between Date elements. →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

➢ **System Date**

Choose this option and set the current date by < + > / < - >, which is displayed in format of month/date/year. Reasonable range for each option is: Month (1-12), Date (01-31), Year (Maximum to 2099), Week (Mon. ~ Sun.)

➢ **System Time**

Choose this option and set the current time by < + > / < - >, which is displayed in format of hour/minute/second. Reasonable range for each option is: Hour (00-23), Minute (00-59), Second (00-59)

◆ **Config**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Main **Config** Advanced Monitor Boot Security Save & Exit	
Power Configuration	
Restore AC Power Loss [Last State]	→←：Select Screen
Display Configuration	↑↓：Select Item
IGFX – Boot Type [CRT]	Enter：Select
DP-to-LVDS Panel Type [800x600/18/Single]	+/-：Change Opt
LVDS BackLight Value 128	F1：General Help
Fixed Graphics Memory Size [128MB]	F2：Previous Values
	F3：Optimized Defaults
Audio Configuration	F4：Save
Azalia Controller [HD Audio]	ESC：Exit
USB Configuration	
UHCI #1 (ports 0 and 1) [Enabled]	
UHCI #2 (ports 2 and 3) [Enabled]	
UHCI #3 (ports 4 and 5) [Enabled]	
UHCI #4 (ports 6 and 7) [Enabled]	
USB 2.0(EHCI) Support [Enabled]	
PCIe Root Port Configruation	
All PCIe Port [Enabled]	
Automatic ASPM [Manual]	
ASPM L0s [Disabled]	
ASPM L1 [Disabled]	
Mini PCIe Slot [Auto]	
Automatic ASPM [Manual]	
ASPM L0s [Disabled]	
ASPM L1 [Disabled]	
LAN Configuration	
LAN2 [Auto]	
Automatic ASPM [Manual]	
ASPM L0s [Disabled]	
ASPM L1 [Disabled]	
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

➢ **Restore AC Power Loss**

This option can set the system status when the computer is powered on after powered off under AC.

* Power Off

  S5 status, i.e. the computer needs to be manually powered on after AC power is connected.

* Power On

  S0 status, i.e. the computer is automatically powered on after AC power is connected.

* Last State

  Return to S0 or S5, depending on the status when the computer is disconnected from AC power. For example, if the computer is at power-on status (S0 status), the computer is automatically powered on after AC power is connected; if the computer is at power-off status (S5 status), the computer will not be automatically powered on after AC power is connected (remain S5 status).

- **IGFX – Boot Type**

  Set the primary display device booted by IGD.

- **DP-to-LVDS Panel Type**

  Used to select resolution of onboard LVDS

- **LVDS BackLight Value**

  Set LVDS backlight brightness adjustment

- **Fixed Graphics Memory Size**

  Set the graphics memory size.

- **Azalia Controller**

  Used to enable or disable audio card controller

- **UHCI #X (ports X and X)**

  Used to set controller mode to enable or disable.

- **USB 2.0(EHCI) Support**

Used to enable USB2.0.

- **All PCIE Port**

Used to enable or disable all devices connected to PCIE ports, including LAN1, LAN2 and Mini PCIE Slot.

- **Mini PCIE Slot**

Used to enable or disable Mini PCIe Slot on the motherboard.

- **LAN2**

Used to enable or disable LAN2 on the motherboard.

- **Automatic ASPM**

This option is used to select automatic or manual setup of power management function for devices on the motherboard.

- **ASPM L0s**

This option is used to enable or disable L0s power saving function

- **ASPM L1**

This option is used to enable or disable L1 power saving function

◆ **Advanced**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Main Config **Advanced** Monitor Boot Security Save & Exit	
▶ CPU ▶ SATA ▶ USB ▶ COM ▶ PPM ▶ Clock Generator ▶ EVOC Features	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

➢ **CPU**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Advanced	
CPU Processor Type Intel(R) Atom(TM) i5 CPU EMT64 Supported Processor Speed 1600 MHz System Bus Speed 400 MHz Ratio Status 16 Actual Ratio 16 System Bus Speed 400 MHz Processor Stepping 30661 Microcode Revision 266 L1 Cache RAM 2x56 k L2 Cache RAM 2x512 k Processor Core Dual Hyper-Threading Supported Hyper-threading [Enabled]	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

Display the relevant information of CPU. Note: the Type, Speed, Core, HT and other information of CPU are related to the CPU installed in the platform, and different information will be displayed for different series of CPUs.

- **Hyper-Threading**

  Control switch of the Hyper Threading Technology function

➢ **SATA**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.		
Advanced		
SATA Port0	Not Present	→←：Select Screen
SATA Port1	Not Present	↑↓：Select Item
		Enter：Select
SATA Controller(S)	[Enabled]	+/-：Change Opt
Configure SATA as	[IDE]	F1：General Help
		F2：Previous Values
SATA Port Mode as	[mSATA Device]	F3：Optimized Defaults
HDD Latency Time	[Disabled]	F4：Save
		ESC：Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.		

SATA Port0 ~ 1 dynamically detect whether there are SATA devices on the motherboard. If devices are connected with the corresponding ports, then it will display the SATA device type. Otherwise, it will display “Not Present”.

- **SATA Controller(S)**

  SATA controller is used to enable or disable devices on SATA Port.

- **Configure SATA as**

  To configure the type of SATA settings: IDE or AHCI.

- **SATA Port Mode as**

  To select whether SATA interface is used for mSATA device or CF card.

- **HDD Latency Time**

  Used to increase HDD detection time during power-on.

➢ **USB**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Advanced	
USB Configuration USB Devices: 1 Keyboard，1 Mouse, 2 Hubs Legacy USB Support [Enabled]	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

- **Legacy USB Support**

This option is used to support legacy USB devices (keyboard, mouse, storage device, etc). When it is set to Enabled, the USB devices can be used in the OS that does not support USB, such as DOS. When it is set to Disabled, the legacy devices cannot be used in the OS that does not support USB

Note: USB can be used in EFI application, such as in Shell.

➢ **COM**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Advanced	
COM ►Serial Port 0 Configuration ►Serial Port 1 Configuration ►Serial Port 2 Configuration ►Serial Port 3 Configuration	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

- **Serial Port 0～3 Configuration**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Advanced	
Serial Port 0～3 Configuration	→←：Select Screen ↑↓：Select Item
Serial Port [Enabled]	Enter：Select
Device Settings IO=3F8h; IRQ=4;	+/-：Change Opt F1：General Help
Change Settings [Auto]	F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

*** Serial Port0～3**

This option is used to enabled or disable the current serial port.

*** Device Settings**

This option is used to display the current resource configuration of the serial port.

*** Change Settings**

This option is used to configure the resources (IO and IRQ) used by the serial port.

- **PPM**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Advanced	
PPM Configuration	→←：Select Screen ↑↓：Select Item
EIST [Enabled]	Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

- **EIST**

  This option is used to support frequency regulation capability of Intel CPUs.

➢ **Clock Generator**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Advanced	
Clock Generator Spread Spectrum [Disabled]	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

- **Spread Spectrum**

  This option is used to set spread spectrum function of clock signal.

➢ **EVOC Features**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Advanced	
EVOC Features FMI Configuration [Enabled] Time Record Support [Enabled] eDisk Support [Disabled] eLogo Support [Disabled]	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

- **FMI Configuration**

This option is a general switch, used to control whether EVOC Features are supported. 。

- **Time Record Support**

Use to record the time of motherboard operation

- **eDisk Support**

Used to enable or disable virtual disk

- **eLogo support**

Used to change boot Logo online. This function can be realized only when eDisk Support is enabled.

◆ **Monitor**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.		
Main Config Advanced **Monitor** Boot Security Save & Exit		
PC Health Status		→←：Select Screen
System Temperature	: +26 C	↑↓：Select Item
CPU Temperature	: +57 C	Enter：Select
CpuFan Speed	：N/A	+/-：Change Opt
Vcore	: +1.152 V	F1：General Help
V3.3	: +3.328 V	F2：Previous Values
V5.0	: +5.058 V	F3：Optimized Defaults
V12.0	: +12.091 V	F4：Save
VBAT	: +3.296 V	ESC：Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.		

Display the currently detected hardware monitoring information, such as voltage, temperature, fan speed, etc.

➢ **System Temperature**

Current system temperature, usually monitored by the thermal resistor on motherboard.

- **CPU Temperature**

  Current CPU temperature, monitored by the temperature sensor on the motherboard.

- **CPU Fan Speed**

  Monitoring of current system fan and CPU fan speed.

- **Vcore**

  CPU core voltage.

- **V3.3/ V5.0/V12.0**

  Switching power output voltage.

- **VBAT**

  CMOS battery voltage .

◆ **Boot**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Main Config Advanced Monitor **Boot** Security Save & Exit	
Boot Configuration Quiet Boot [Disabled] **Boot Option Priorities** Boot Option #1 [Built-in EFI Shell] ▶ **Special Boot Order Configuration**	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

- **Quiet Boot**

  Boot mode selection switch, which is used to enable or disable Quiet Boot function.

- **Boot Option Priorities**

  This option is used to configure the system booting priorities. #1 represents the highest priorities while #n represents the lowest priorities.

➢ **Special Boot Order Configuration**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Boot	
Special Boot Order Configuration Special Boot Order Configuration [Disabled]	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

● **Special Boot Order Configuration**

This option is used to configure the boot order of traditional devices in BBS.

◆ **Security**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Main Config Advanced Monitor Boot **Security** Save & Exit	
Password Description If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights. Administrator Password User Password	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

➢ **Setup Administrator Password**

This option is used to set administrator password.

Note: If ONLY the Administrator's password is set, the password is only asked for when entering Setup;

◆ **Save & Exit**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Main Config Advanced Monitor Boot Security **Save & Exit**	
Save Changes and Reset Discard Changes and Reset	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.16.1226. Copyright (C) 2012,American Megatrends, Inc.	

➢ **Save Changes and Reset**

This option is used to save changes and reset.

➢ **Discard Changes and Reset**

This option is used to discard changes and reset.

3.4 System Resource Managed by UEFI under X86 Platform

We define three kinds of system resources here: I/O port address, IRQ interrupt number and DMA number.

- **DMA**

Level	Function
DMA0	Unassigned
DMA1	Unassigned
DMA2	Unassigned
DMA3	Unassigned
DMA4	Used for DMAC cascade
DMA5	Unassigned
DMA6	Unassigned
DMA7	Unassigned

- **APIC**

Advanced programmable interrupt controller. Most motherboards above P4 level support APIC and provide more than 16 interrupt sources, like IRQ16 - IRQ23; while some others can have up to 28 interrupt sources, such as motherboard supporting PCI-X. However, relevant OS are required to enable that function.

- **IO Port Address**

Only 16 IO address lines are designed for X86, from 0 ~ 0FFFFh; there is 64K for the system I/O address space. In traditional ISA connector, only the foregoing 1024 (0000 ~ 03FFh) are adopted while the ports above 0400h are adopted by PCI and EISA connectors. Each peripheral will occupy portion of the space. The table below shows the I/O connectors used in X86 platform:

Address	Device Description
000h – 001Fh	DMA Controller #1
020h - 021h	Programmable Interrupt Controller
040h - 043h	System Timer
060h - 060h	PS/2 standard keyboard
064h – 064h	PS/2 standard keyboard
070h - 071h	System CMOS/real-time clock
081h - 091h	DMA controller
0A0h – 0A1h	Programmable Interrupt Controller
0C0h – 0DFh	DMA Controller
0F0h – 0FFh	Numeric data processor
2E8h – 2EFh	COM4
2F8h – 2FFh	COM 2
3B0h – 3BBh	Intel(R) Graphic Media Accelerator
3C0h – 3DFh	Intel(R) Graphic Media Accelerator
3E8h – 3EFh	COM 3
3F8h – 3FFh	COM1
4D0h – 4D1h	Programmable Interrupt Controller
D00h – FFFFh	PCI Bus

◆ **IRQ Assignment Table**

There are 15 interrupt sources of the system. Some are occupied by the system devices. Only the ones that are not occupied can be assigned to other devices. ISA device requests exclusive use of its interrupt. Only the plug and play ISA devices can be assigned by the UEFI or the OS. And several PCI devices share one interrupt, which is assigned by UEFI or OS. Interrupt assignment of some devices of X86 platform is shown in the table below, but it does not show the interrupt source occupied by the PCI devices

Level	Function
IRQ0	System Timer
IRQ1	Standard 101/102 keyboard or Microsoft keyboard
IRQ2	Reserved
IRQ3	COM2
IRQ4	COM1
IRQ5	Reserved
IRQ6	Reserved
IRQ7	COM3/4
IRQ8	System CMOS/real-time clock
IRQ9	Reserved
IRQ10	Reserved
IRQ11	Reserved
IRQ12	PS/2 keyboard
IRQ13	Numeric data processor
IRQ14	Reserved
IRQ15	Reserved

4. Installing the Drivers

Regarding the driver program of this product, please refer to the enclosed CD.

5. Appendix

5.1 BPI Function

EVOC BPI (BIOS Programming Interface) is a cross-platform, easy-to-maintain software interface specification, which supports access to hardware under the Protected Mode of the operating system. The function of the product is to provide a unified standard interface for the application software or driver; therefore, when the hardware of the motherboard is upgraded, there is no need to modify the application software or driver and the former software can operate on the new platform normally. It has greatly sped up the product development and reduced the maintenance cost. Currently, BPI supports the configuration of WDT and GPIO as well as H/W monitor function. As for the test program and function library, please refer to the relevant documents in the enclosed CD.

Features of the BPI include:

1. Platform Irrelevant

   The software developed by BPI function library can operate on a new platform, supporting BPI function, normally without making any modification.

2. Security and High Reliability

   The BPI function library accessing the hardware is programmed by the motherboard developer and is strictly tested; therefore, it can avoid system malfunction caused by improper operation of the system hardware.

3. Flexible Configuration

   Take GPIO configuration as an example, users may conveniently configure an arbitrary GPIO function by BPI function library or test program.

4. Easy Maintenance

   Traditional WDT and GPIO programming are closely related to the hardware with complicated test and debug process and software of different platforms; however, the software developed by BPI only requires one set of the maintenance software.

5. Low Cost

   Developing the applications by BPI will not result in additional hardware and software cost, but it will reduce the development difficulty, development cycle and time-to-market for the system integrator.

5.2 Troubleshooting and Solutions

Common Fault	Issues to be Checked
Unable to bootup after powered on	1. Please make sure whether the power cord is well connected; 2. Please make sure whether the adopted power supply meets the power requirement of the motherboard; 3. Please check whether the CPU has been properly installed and whether the CPU has been buckled properly; 4. Remove and install the memory module again; 5. Replace the memory module; 6. Please clear the CMOS according to the Manual; 7. Please make sure whether there are peripheral cards connected, and whether it is normal after removing the peripheral cards;
BIOS Setup cannot be saved	Please check whether the CMOS battery voltage is lower than 2.8V; if so, replace it with a new battery, set and save the BIOS Setup again.
No bootable device can be found	1. Please make sure the power cable or data cable of the HDD is connected properly; 2. Please check whether there is physical damage to the HDD; 3. Please make sure operating system has been normally installed in the HDD.
Blue screen or computer crush occurred when entering system	1. Please check whether the memory module or the peripheral card is loose; 2. Try to remove the newly installed hardware, uninstall the driver or software; 3. Try to replace the memory module.
Slow to enter operating system	1. Please check whether there are bad tracks on the hard disk by third party software; 2. Please make sure the remaining space on the system partition is enough; 3. Please check whether the CPU fan is operating normally.

System reboots automatically	1. Please make sure the CPU fan is operating normally; 2. Please check whether the reset button has been triggered by accident; 3. Please check whether the system is affected by virus using anti-virus software; 4. Please check whether the memory module or the peripheral card is loose; 5. Please make sure the load carrying capability of the adopted power supply is enough; you may try to replace the power.
No USB device can be detected	1. Please confirm whether independent power supply is required on the USB device; 2. Please check whether ill contact exists on the USB port; 3. Please make sure the USB controller in BIOS Setup has been enabled.
No PCI card can be detected	1. Please check whether additional power supply is needed on the PCI card; 2. Please make sure whether the operating voltage of the PCI card is in accord with that supplied by motherboard (5V by default); 3. Please make sure whether the PCI slot can be identified after replacement.
No ISA card can be detected	1. Please make sure the resources used by ISA card have been reserved by BIOS according to the ISA card manual -- there are reserved options in BIOS Setup for ISA to use I/O or memory resource on most of the motherboards; and check whether the IRQ used by ISA card has been reserved in BIOS Setup; 2. The ISA card usually cannot be identified directly under the system; please choose “Add Hardware” in the “Control Panel” in Windows system to set.